central tail-feathers rufous, irregularly patched with black; outer tail-feathers uniformly rich rufous, thinly margined on the inner sides with dusky brown, each feather banded with black and tipped with white; underside of tail-feathers similarly marked, but of a brownish dusky shade. Under tail-coverts rich rufous, tipped with white.

I take the liberty of naming this new species after my esteemed friend, the well-known ornithologist, Hofrath Dr. A. B. Meyer, Director of the Dresden Museum.

The type specimens of these new species belong to the Hungarian National Museum.

Budapest, Nov. 28, 1885.

XIX.—*On the Claws and Spurs of Birds' Wings.*

By P. L. Sclater, M.A., Ph.D., F.R.S.

In the 'Proceedings' of the Boston Society of Natural History for 1881 (vol. xxi. p. 301) will be found an excellent paper by Mr. J. Amory Jeffries, "On the Claws and Spurs on Birds' Wings," which, I regret to say, has hitherto escaped notice in the columns of this Journal. It is, however, eminently worthy of careful study. Mr. Jeffries shows definitely for the first time, so far as I can make out*, that the spurs which are in some cases found on the wings of birds are of an entirely different nature from the claws also met with on the same organs, and have, in fact, nothing whatever to do with them.

The spur, as Mr. Jeffries points out, is a structure on the wing which corresponds to the spur on the tarsus of the

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* Even so recent an authority as Dr. Selenka ('Bronn's Thier-Reich,' Aves, p. 75) has confounded together the spur and claw of birds. His account of the subject contains several serious misstatements, and is obviously not based on his own examination. Owen's 'Anatomy of Vertebrates' (*cf. op. cit.* ii. p. 74) likewise confounds claws and spurs. It must be even admitted that Nitzsch (usually a model of accuracy, and the first scientific describer of the claws of birds) did not quite understand the differences between claws and spurs (see his 'Osteographische Beiträge,' no. 5. "Ueber das Nagelglied der Flügelfinger, besonders des Daumens:" Leipzig, 1811).

Common Fowl and of many others of the Phasianidæ. It consists of a bony core covered with a thick horny coat, and may, as I shall presently show, arise either from the carpus or from the metacarpus. Its function appears to be purely that of a weapon of offence. It is found in many quite unconnected groups of birds, such as the Spur-winged Plovers (*Hoplopterus*), the Jacanas (*Parra*), the Screamers (*Chauna* and *Palamedea*), the Spur-winged Geese (*Plectropterus*), and the Torrent-Ducks (*Merganetta*). These genera are widely separated; and it is obvious that in each case the spur must have been specially developed.

On the other hand, the claws on the wings of the bird, as Mr. Jeffries has likewise clearly explained, are the homologues of the claws on the feet: that is, they are dwarfed representatives of the nails on the anterior extremities which birds have inherited from their reptilian ancestors. They are absolutely useless to birds in their present state of existence —at any rate when the bird is adult—as they are so covered over by the feathers that it is in most cases very difficult to find them. If, however, a careful search be made at the end of the first and second digits of certain birds, a small claw will be discovered investing the last phalanx. Usually, if present, the claw is found at the end of the first digit; more rarely it occurs on the second. When it is placed on the first digit it will be found at the end of the second (or ungual) phalanx; when it occurs on the second digit it will be found at the end of the third (or ungual) phalanx. This shows that the claw is a remnant of the nail that formerly terminated the first two digits, and proves that, as Mr. Jeffries says, the ancestors of birds had a two-jointed first finger and a three-jointed second finger, both provided with claws. This was also the case with *Archæopteryx*, which had, moreover, a claw on its third digit *. But such is not the case in modern birds, in which the claws, when still existing, are found only at the extremities of the first and second digits.

My attention having been called to this subject, I have had some preparations made which serve to illustrate several new points, or points which I think have not as yet been quite clearly understood. These I will take up as they come before me.

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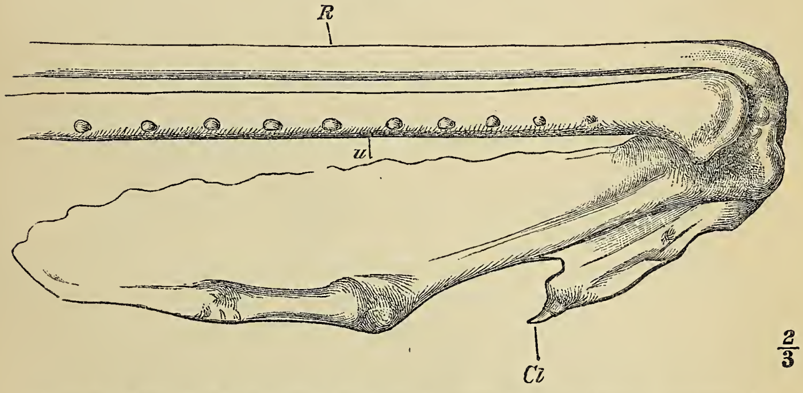
* See Vogt's description and figure of the manus of *Archæopteryx*, Ibis, 1880, pp. 438, 443.

1. The Wing-claw of the King Vulture (*Gypagus papa*).

Dr. R. Shufeldt (Am. Nat. vol. xv. p. 906) was the first to show the presence of a claw on the index digit of *Cathartes atratus* and *Pseudogryphus californianus*; and its existence in both species of *Cathartes* was subsequently confirmed by Mr. W. A. Forbes (Am. Nat. xvi. p. 141). Dr. Shufeldt alludes also to its existence in the King Vulture; and I have now great pleasure in confirming the presence of a well-developed claw in this form of the Cathartidæ. The drawing given herewith (fig. 1) represents the outer surface of the right wing of a specimen of this bird that recently died in the Zoological Society's Gardens. The claw (*Cl*) at the extremity of the first finger is small and very slightly curved, but, as will be seen, very distinctly manifest. It measures about ·015 inch in length.

Fig. 1.



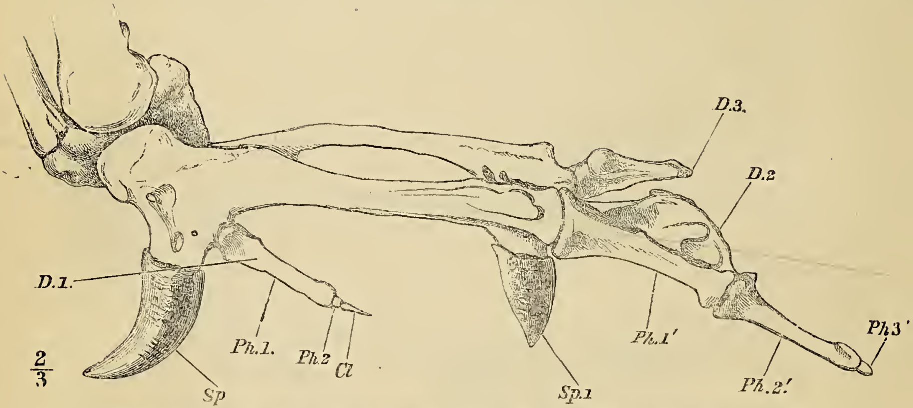
Outer surface of right wing of the King Vulture (*Gypagus papa*), reduced $\frac{2}{3}$, with feathers removed. *Cl*, claw on first digit. The flesh is removed from the radius (*R*) and ulna (*u*).

I have not yet had an opportunity of examining any of the Vultures of the Old World, to see whether a corresponding structure is met with in them; but Dr. Shufeldt was unable to find it in the specimens which he examined, and if its non-existence is confirmed, another item will be added to the many differences which separate the Vultures of the Old World from the so-called Vultures of the New World.

2. The Claw and Spurs of the Screamer (*Chauna derbiana*).

The wing of a Screamer (*Chauna derbiana*) lately sent to me by a correspondent in Venezuela has supplied a very interesting specimen, as it affords an example of a well-developed claw and two spurs coexisting in the same species.

Fig. 2.



Outer surface of end of left wing of Screamer (*Chauna derbiana*), reduced $\frac{2}{3}$, showing two metacarpal spurs (*Sp*, *Sp.* 1) and claw on the first digit (*Cl*). *D.* 1, first digit: *Ph.* 1, first phalanx; *Ph.* 2, second phalanx. *D.* 2, second digit: *Ph.* 1′, first phalanx; *Ph.* 2′, second phalanx; *Ph.* 3′, third phalanx. *D.* 3, third digit.

The wing-spurs in the Screamer are well known to be of enormous size, and are no doubt formidable weapons of offence. They are placed one on the proximal and the other at the distal extremity of the coalesced metacarpals, and project nearly in a straight line away from the radial edge. The first spur, which rises from the base of the metacarpal, on the proximal side of the attachment of the index digit, consists of an elongated osseous base, about 1·3 inch in length, slightly recurved towards the radius. The horny covering, which is shown *in situ* in the drawing (*Sp*), extends about ·2 inch further. The second spur (*Sp.* 1) is exserted nearly in the same plane at the further extremity of the metacarpal; it is not quite so long, measuring, together with the horny covering on it, about 1 inch in length, and is rather more flattened in shape and has but slight indications of backward curvature. Just in front of the first spur is situated the index digit (*D.* 1); it consists of a long first phalanx measuring about 1 inch in length, what is apparently a very short second or ungual phalanx measuring only 0·1 inch, and a slight pointed claw of about 0·2 inch in length attached to this phalanx. Thus the whole first digit, from the base to the extremity, measures 1·3 inch.

Nothing can better illustrate the entire diversity, in origin and position, of the "wing-spur" and "wing-claw" than this specimen.

[To be continued.]

XX.—*On some Papuan, Moluccan, and Sulu Birds.*

By T. Salvadori, C.M.Z.S.

Through Dr. Nehrkorn's kindness I have been able to examine some of the birds mentioned by him in his paper "Zur Avifauna der Insel Waigiou" (Journ. f. Orn. 1885, pp. 30–35), and I have found, as I suspected, that some species have not been rightly identified. I should not have mentioned this if it had had no bearing upon the geographical distribution of some of the species; but this being the case, I think that it will be right to point out what those species really are.

Cyclopsittacus aruensis, Nehrkorn, Journ. f. Orn. 1885, p. 31.

Out of twenty specimens attributed to the above-mentioned species, two have been presented by Dr. Nehrkorn to